



# INDIANA DEPARTMENT OF TRANSPORTATION

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## Design Memorandum No. 12-13 Technical Advisory

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**TO:** All Design, Operations, and District Personnel, and Consultants

**FROM:** /s/ David H. Boruff  
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**SUBJECT:** Traffic-Signal Loop Tagging Table

**ADDS:** *Indiana Design Manual Section 77-5.09(03)*

**EFFECTIVE:** Immediately

*Indiana Design Manual* Section 77-5.09 regarding vehicle counting loops, and Figures 77-5AA through 77-5CC, include guidance for the configuration of counting and non-counting vehicle detector loops. However, this guidance does not describe the standard procedure for organizing the loops into a table that the contractor can use to identify the number of loop detector racks needed for the signal-controller cabinet.

Figure 77-5DD, the Loop Tagging Table, which appears on the editable-documents webpage, at <http://www.in.gov/dot/div/contracts/design/dmforms/index.html>, shall be completed for the signalized intersection plan, including properly-identified loop numbers, vehicle directional movements with associated lane designations, phase assignments, individual loop numbers, and count output numbers. The completed Loop Tagging Table should be included in the Contract Information Book. Instructions for completing the Loop Tagging Table are shown below.

1. Loop Number. The loop number shall be left blank as it will be assigned by the signal-controller vendor. Once assigned by the vendor, the loop number will be the detector-rack channel number for each additional rack added. The channel numbers shall be increased by sixteen, i.e., the third detector rack's first loop number is 33. The loop numbers shall be assigned in groups as counting and non-counting channels. Each group shall follow the direction and lane-designation convention. To minimize the number of

detection channels required, counting-loop channels shall be grouped first followed by non-counting channels. The order of the loops shall minimize the number of loop amplifiers and detector racks required for the operation. If micro-loops are used with Canoga amplifiers, loops shall be numbered in three groups with the Canoga amplifier channels following the non-counting channels.

2. Direction of Vehicle Movement. The Loop Tagging Table shall begin with highest-priority route, either the northbound or eastbound movement including phase 2. The corresponding first cardinal-direction letter for each movement, N for north, S for south, E for east, W for west, shall be entered in the Table. The remaining movements shall be labeled and listed according to plan view, clockwise from the movement including phase 2, followed by the movement including phases 4, 6, and 8, omitting missing movements and corresponding phases. Phase designations may vary for specialized signal operations.
3. Lane Designation. Loops shall be listed in the Table starting with the farthest-left lane for each approach and continuing to be listed sequentially to the right, designated as follows.
  - a. Left-Turn Lanes. Exclusive left-turn lanes shall be designated with an L for left in the Table. Multiple left-turn lanes on a single approach shall be designated with an additional alpha character identifier so that LA represents the leftmost left-turn lane, followed by LB and LC respectively, and continuing for each subsequent left-turn lane for that approach.
  - b. Through Lanes. Through lanes or a shared through/right or shared through/left lane shall be designated with an A for the leftmost lane followed alphabetically by B, C, etc., for each subsequent through lane. Loops from different lanes shall not be connected together. Loops placed in the right-turn radius shall be designated as being in the through lane. A radius loop that is a counting loop shall have an exclusive lead-in.
  - c. Right-Turn Lanes. Exclusive right-turn lanes shall be designated as R for right. Multiple right-turn lanes on a single approach shall be designated with an additional alpha character identifier so that RA represents the leftmost right-turn lane, followed by RB and RC respectively, and continuing for each subsequent right-turn lane for that approach.
4. Phase Number. The phase number shall be the controller phase number, 1 through 16, assigned to each protected movement corresponding to each lane.

5. Loops. On each approach with stop-line detection, loop number 1 will normally be at the stop line for the lane. Loop number 2 shall be the next loop away from the stop line in the same lane. The loop numbering shall continue in order, for the through portion of the lane, from the stop line back. The next loop number shall be assigned to the adjacent right-turn radius loop at the stop line followed by the next radius loop away from the stop line until all radius loops are numbered. The advance loops that may be in the same lane as the stop line loops shall be numbered in order following the right-turn radius loops. All loops connected to one lead-in shall be listed in order separated with a comma. For micro-loops, these numbers shall have an M directly in front of them with no space between the M and the numbers, i.e., M1,2,3 or M4.
6. Count Output. This number shall be left blank as it will be assigned by the signal-controller vendor. Each lane will have a count output. Once assigned by the vendor, the count-output number will be labeled identically to the controller-detector channel that is assigned to log the count pulse. Count output for a counting amplifier is typically 2 channels higher than the corresponding Presence output, unless an auxiliary BIU is installed. Where logging the call output of a standard, or non-counting, amplifier, the space in the Table's C # column shall be left blank. No number shall be used more than once for combined loop and count-output numbers.
7. Asterisk. An asterisk will be placed after each counting-loop tag to denote it as a counting loop. The vendor will then know how to build the cabinet for counting.

DHB/alu